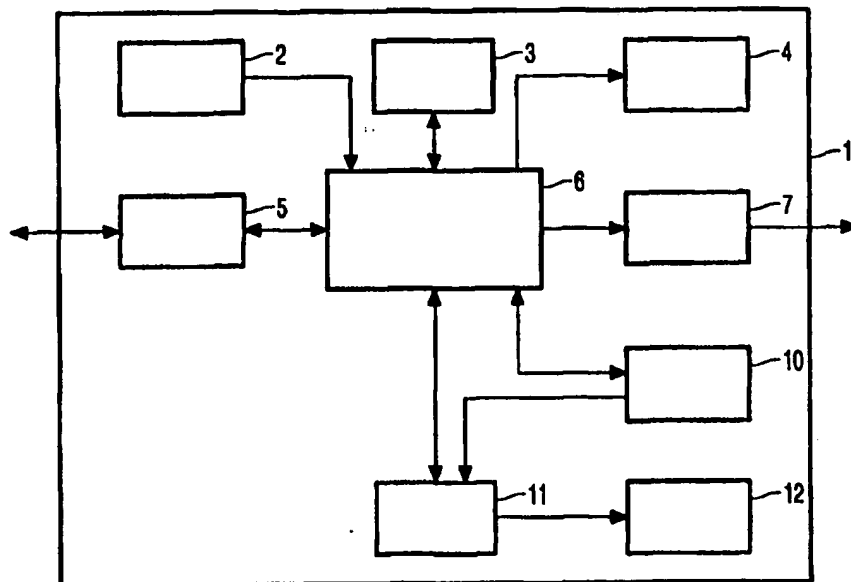




## INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

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(54) Title: INFORMATION PROCESSING DEVICE



## (57) Abstract

The invention relates to an information processing device (1), including a user control unit (2) for the selection of units of primary information to be processed and functions to be invoked. The device includes storage means (3) for storing the primary information, and secondary storage means (10) for storing a user profile. The device furthermore includes communication means enabling the user profile to be exchanged with persons carrying a similar device.

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Information processing device.

## FIELD OF THE INVENTION

The invention relates to an information processing device as defined in the preamble of Claim 1. The invention further relates to a method for processing information as defined in the preamble of Claim 7.

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## BACKGROUND OF THE INVENTION

A device as defined above is widely known. For example, a CD-player or MP3-player processes digital audio files so as to make them audible through a headphone or loudspeaker. The audio files constitute primary information of the player, since it is the player's primary function to process and play the audio files. An MP3-player comprises a digital memory for storing the audio files, while a CD-player has removable storage means, i.e. respective CDs. As another example, an organizer or personal digital assistant (PDA) enables entry, storage and retrieval of digital data, such as addresses and appointments. Such digital data constitutes primary data of the organizer or PDA since it relates to the primary function of these devices.

15

The primary data processed by the known devices often reflects aspects of the owner's personality, e.g. music files tell something about the owner's musical taste, and addresses and appointments tell something about the owner's occupations and circle of acquaintances.

20

## OBJECT AND SUMMARY OF THE INVENTION

It is an object of the invention to provide a device that enables a user to exchange information about the user's preferences with respect to the primary function of the device with other people so as to discover common preferences or interests.

25

To this end, a first aspect of the invention provides a device as claimed in Claim 1. A second aspect of the invention provides a method as claimed in Claim 7. Advantageous embodiments of the invention are defined in the dependent Claims.

The information processing device as defined in Claim 1 enables a user to store a profile of the user's preferences. For example, the owner's musical taste could be

represented by a tree of music categories such as classic, jazz, pop, and subcategories such as baroque music, bebop and rock, each category being rated according to the owner's taste. Furthermore, ratings of composers and performers could be included in the user profile. Such user profiles are well known from internet sites which recommend music to visitors based on the visitor's profile. As another example, the further storage means could contain information about the owner's hobbies or circle of acquaintances. The user profile can be exchanged with people having a similar device, through the communication means of both devices.

In an embodiment of the invention as claimed in Claim 2, the matching means automatically compare the user profile stored in the further storage means and a user profile which is received from a similar device. Hence, the owners of the devices themselves need not search for similarities between their user profiles.

In an embodiment of the invention as claimed in Claim 3, the alerting means constitute an agent which continuously compares user profiles received from similar devices with the user profile stored in the further storage means, and when it detects a strong resemblance between said user profiles, the user is notified of this strong resemblance. For example, the owner of an MP3-player is warned when someone nearby is carrying a similar device and has a similar music taste, enabling both persons to become acquainted and exchange audio files. As another example, the owner of a PDA is warned when someone nearby is carrying a similar device and the user profiles contained in both devices indicate a shared hobby or common acquaintance.

In an embodiment of the invention as claimed in Claim 4, the alerting means also indicate the relative position of the similar device containing the similar user profile. This makes it more easy to locate the user of the similar device in a crowd. The indication could comprise a direction and/or a distance, e.g. indicated by LEDs or graphically.

In an embodiment of the invention as claimed in Claim 5, the matching means describe the resemblance on a graphical display, e.g. enumerating common hobbies or music categories which both users like. In this way, the nature of the resemblance is quickly apparent to the users.

In an embodiment of the invention as claimed in Claim 6, the device comprises profiling means, e.g. a software agent, which monitors the use of the device, i.e. the units of primary information which are being processed and which processing functions of the device are being invoked. From these observations, the profiling means derive profile information which is stored in the further storage means. For example, by monitoring which audio files are played on an MP3-player and utilizing related information which is acquired along with said

audio files, e.g. information about composers, performers and music categories, a user profile representing the user's musical taste can be generated. The user profile may also include general information concerning the use of the device, such as the date of acquisition by the owner, the total time of ownership, information about a person from whom a unit of primary  
5 information has been acquired, a date or city of the acquisition, a frequency of playing an audio-track, etc. After using the device for some time, the device has built up a history of personal information, which could be valuable for facilitating making contacts with other people. The device according to the invention could play a role in bringing together people having similar tastes or common acquaintances.

10 The invention is particularly suitable for digital audio players, such as MP3-players, or PDAs. The invention is also applicable, for example, to GSM telephones, remote controls, (portable) television receivers, video recorders etc.

It is to be noted that a device is known, informally called a "lovegetty", which has 4 predefined states and communicates with other lovegetties present within a range of less  
15 than 10 meters. When two lovegetties with the same state selected approach each other, they both start to blink and beep.

## BRIEF DESCRIPTION OF THE DRAWINGS

These and other aspects of the invention will be apparent from and elucidated  
20 by way of a non-limitative example with reference to a drawing in which:

Figure 1 shows an MP3-player as an embodiment of the device according to the invention;

Figure 2 shows a further MP3-player as an alternative embodiment of the device according to the invention.

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## DESCRIPTION OF EMBODIMENTS

The figure shows an MP3-player 1 which includes a user control unit 2, a primary storage 3, a graphical display 4, an interface 5, a microprocessor 6, an audio processor 7, a secondary storage 10, a matcher 11 and an alerter 12. The user operates the MP3-player 1  
30 by means of the control unit 2 which sends commands to the microprocessor 6. The microprocessor 6 receives commands from the control unit 2; it sends and receives digital audio information and additional data through the interface 5. The microprocessor 6 also stores and retrieves digital audio information in the primary storage 3 and digital data in the secondary storage 10, sends graphical information to the display 4 and digital audio

information to the audio processor 7. The audio processor 7 converts the digital audio signals into analog audio signals which can be further processed by a headphone or an amplifier (not shown). The matcher 11 retrieves digital data from the secondary storage 10 and communicates digital data with the microprocessor 6. The matcher 11 also controls the alerter 12.

The MP3-player 1 receives digital MPEG-3 audio files and descriptive information through the interface 5 and stores them in the primary storage 3. In response to a user command, any audio file in the primary storage 3 can be played through the audio processor 7 and listened to by means of e.g. a headphone. The descriptive information, e.g. comprising the title of the audio file, the composer and the performer, is displayed on the display 4 when the corresponding audio file is being played.

The audio files may be derived from a CD-player, from the internet or from a similar MP3-player. Audio files can also be sent to similar MP3-players through the interface 5.

The owner of the MP3-player 1 may store a personal user profile in the secondary storage 10. Such a user profile could be prepared on a personal computer and to be derived through the interface 5. Alternatively, the user profile can be entered by means of the user control unit 2. The user profile contains personal ratings for various music categories, composers, performers etc. The interface 5 is further adapted to communicate with similar devices within a restricted area, for example, having a radius of approximately 10 meters, e.g. by means of electro-magnetic waves or infrared signals. When the presence of a similar device is detected within said range, the user profile is read from the secondary storage 10 and transmitted to the similar device. When a user profile is received from the similar device, it is relayed to the matcher 11, which compares the received user profile with the user profile contained in the secondary storage 10. If the matcher 11 discovers a resemblance, e.g. both user profiles indicate that the respective owners like music composed by Mozart, it controls the alerter 12 to give a signal, e.g. a flashing LED or a beeping sound, and generates a short survey of the resemblance to present it on the display 4. If a user profile is comprehensive and the transmission bandwidth is small, only a part of it could be transmitted initially, e.g. only the categories or composers of the highest rating. If a substantial resemblance is found with respect to these partial user profiles, the complete profiles could be exchanged as yet.

In an advanced embodiment the receiving part of the interface 5 comprises a directional antenna, enabling the relative position of the other device to be determined and indicated on the display 4, e.g. by a graphical representation of an arrow.

Figure 2 shows a further MP3-player as an embodiment of the device according to the invention. Reference numbers which occur in both figures denote the same components. The MP3-player of Figure 2 includes additionally a clock 8 and a profiler 9. The profiler 9  
5 monitors the use of the device, e.g. it keeps a record of audio files which are stored in the primary storage 3, and how often they are played. It utilizes this data and the descriptive information to determine which music categories, composers and performers the user likes most. Functions invoked by the user while playing an audio file, e.g. sound volume or loudness, could be used to determine whether the user likes certain music as background  
10 music or as music to be listened to attentively.

The resultant user profile is stored in the secondary storage 10. Information from the clock 8 is used to determine whether the user's taste depends on the time of the day or changes over time and to generate general information about the use of the device, e.g. the frequency or total time of use. In this way, the profiler 9 generates a large amount of profile  
15 information which need not be entered explicitly by the user.

Although the invention has been described with reference to specific illustrative embodiments, variations and modifications are possible within the scope of the inventive concept. Thus, for example, the primary storage 3 and the secondary storage 10 could be  
20 distinguishable parts of one large storage, e.g. a flash memory. The profiler 9 could be a separate circuit or be implemented as a software function of the microprocessor 6. The secondary storage 10 may be detachable so as to be processed on a computer or be inserted in a similar device. Furthermore, the device may contain identification means for identifying the user, e.g. by entering a code or analyzing fingerprints, while the secondary storage 10 may be  
25 adapted to store user profiles of multiple users of the device. A user operable function may be provided for activating or deactivating the communication with similar devices through interface 5. Furthermore, the interface 5 could be controlled in such a way that the user profile is not transmitted to similar devices, but that user profiles from other devices are allowed to be received.

## CLAIMS:

1. An information processing device including storage means for storing units of primary information, and user operable means for making selections from the units of primary information to be processed and/or from functions to be invoked, **characterized in that** the device also includes further storage means for storing a user profile regarding said selections,  
5 and communication means for receiving at least a part of such a user profile from a similar device.
2. A device according to Claim 1, **characterized in that** the device also includes matching means for determining a match between said user profile and a further user profile  
10 received from the similar device through the communication means, said match being a measure of a resemblance between said user profile and said further user profile.
3. A device according to Claim 2, **characterized in that** the device also includes alerting means for generating an alerting signal when said match exceeds a predetermined  
15 threshold.
4. A device according to Claim 3, **characterized in that** the alerting means are also arranged to indicate a relative position of the similar device.
- 20 5. A device according to any of the Claims 2 to 4, **characterized in that** the device also includes presentation means for presenting information, the matching means being arranged to present a description of said resemblance on said presentation means.
6. A device according to any of the Claims 1 to 5, **characterized in that** the  
25 device also includes profiling means for deriving said user profile from said selections and for storing said user profile in the further storage means.
7. A method for processing information by means of a device, including the storage of the primary information, and the selection of units of primary information to be



processed and/or functions to be invoked, **characterized in that** the method also includes the storage of a user profile regarding said selections in said device, the exchange of at least a part of said user profile with a similar device, and the generating of an alerting signal when a resemblance between said user profile and a further user profile received from said similar

5 device exceeds a predetermined threshold.

1/1

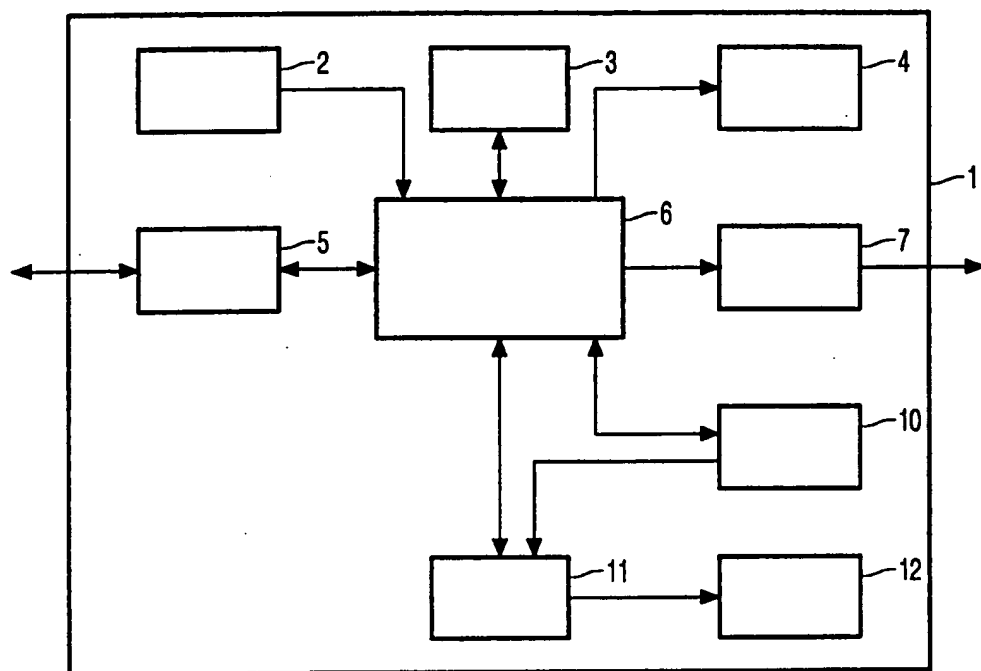


FIG. 1

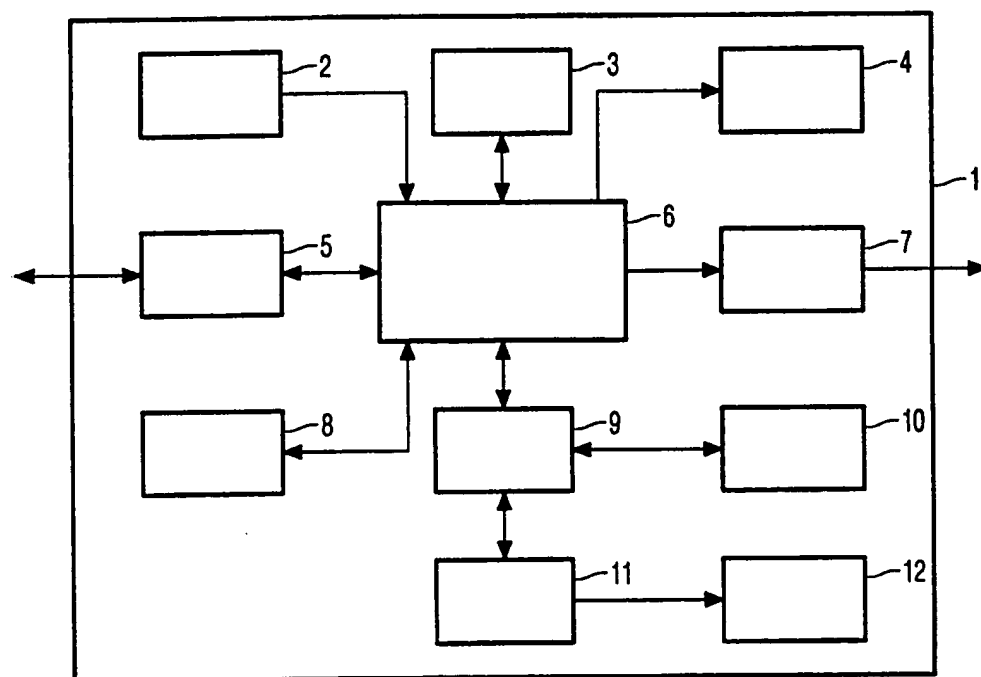


FIG. 2

# INTERNATIONAL SEARCH REPORT

International Application No

PCT/EP 99/06103

## A. CLASSIFICATION OF SUBJECT MATTER

IPC 7 H04B1/034

According to International Patent Classification (IPC) or to both national classification and IPC

## B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

IPC 7 H04Q G08B H04B

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

## C. DOCUMENTS CONSIDERED TO BE RELEVANT

| Category * | Citation of document, with indication, where appropriate, of the relevant passages  | Relevant to claim No. |
|------------|---|-----------------------|
| A          | WO 98 29841 A (FARDIN RAHIN ;GLOBALCON AG (CH); LENKE MICHAEL (DE))<br>9 July 1998 (1998-07-09)<br>abstract   | 1-3,7                 |
| A          | WO 97 47135 A (INTEL CORP)<br>11 December 1997 (1997-12-11)<br>abstract<br>page 8, line 20 -page 16, line 12<br>page 1, line 1 -page 8, line 12<br>figure 2<br>figure 3 | 1,2,6,7               |

☐ Further documents are listed in the continuation of box C.



Patent family members are listed in annex.

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Date of the actual completion of the international search

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# INTERNATIONAL SEARCH REPORT

Information on patent family members

International Application No

PCT/EP 99/06103

| Patent document<br>cited in search report | Publication<br>date | Patent family<br>member(s)  | Publication<br>date  |
|---|---------------------|---|--|
| WO 9829841 A                              | 09-07-1998          | DE 29700029 U<br>DE 29707353 U  | 10-04-1997<br>19-06-1997   |
| WO 9747135 A                              | 11-12-1997          | US 5945988 A<br>AU 3219797 A<br>AU 3409697 A<br>CA 2258895 A<br>CZ 9804277 A<br>EP 0932398 A<br>NO 986051 A<br>WO 9800123 A | 31-08-1999<br>05-01-1999<br>21-01-1998<br>08-01-1998<br>11-08-1999<br>04-08-1999<br>23-02-1999<br>08-01-1998 |